

Claims

- [c1] A polarized light source system comprising:
a light guide plate made of transparent material, and including a light incident surface, a light emitting surface and a bottom surface;
a light source positioned adjacent to the incident surface;
a lamp cover coating with a reflective film on an inner surface thereof adjacent to the light source;
a pair of prism plates with a plurality of micro-prisms substantially meshing with each other, apex angles of the micro-prisms being in the range from 125° to 145° ;
and
a quarter wave plate coated with a reflective film opposite to the bottom surface of the light guide plate.
- [c2] The polarized light source system as described in claim 1, wherein the apex angles of the micro-prisms are 135° .
- [c3] The polarized light source system as described in claim 1, wherein a difference between refractive indices of the prism plates is in the range from 0.001 to 0.2.
- [c4] The polarized light source system as described in claim

1, wherein a length of each of the micro-prisms is in the range from 450 micrometers to 550 micrometers, and a height of each of the micro-prisms is in the range from 200 micrometers to 250 micrometers.

[c5] The polarized light source system as described in claim 1, wherein the micro-prisms of the prism plates define a gap therebetween.

[c6] The polarized light source system as described in claim 5, wherein a difference between refractive indices of the each of the prism plates and the gap is in the range from 0.001 to 0.2.

[c7] A liquid crystal display comprising:
a liquid crystal panel including a thin film transistor substrate, a color filter substrate, liquid molecules filled therebetween, and two polarizers respectively adjacent to the thin film transistor substrate and the color filter substrate, the polarizers having optical axes perpendicular to each other; and
a polarized light source system, including a light guide plate made of transparent material and which includes a light incident surface, a light emitting surface and a bottom surface, a light source positioned adjacent to the incident surface, a lamp cover coated with reflective film on an inner surface thereof adjacent to the light source,

a pair of prism plates having a plurality of micro-prisms substantially meshing with each other, the micro-prisms having apex angles in the range from 125° to 145°, and a quarter wave plate coated with a reflective film opposite to the bottom surface of the light guide plate.

- [c8] The liquid crystal display as described in claim 7, wherein the apex angles of the micro-prisms are 135°.
- [c9] The liquid crystal display as described in claim 7, wherein a difference between the refractive indices of the prism plates is in the range from 0.001 to 0.2.
- [c10] The liquid crystal display as described in claim 7, wherein a length of each of the micro-prisms is in the range from 450 micrometers to 550 micrometers, and a height of each of the micro-prisms is in the range from 200 micrometers to 250 micrometers.
- [c11] The liquid crystal display as described in claim 7, wherein the micro-prisms of the prism plates define a gap therebetween.
- [c12] The liquid crystal display as described in claim 11, wherein a difference between refractive indices of each of the prism plates and the gap is in the range from 0.001 to 0.2.

[c13] A method of making a liquid crystal display, comprising steps of:

providing a light guide plate made of transparent material, said light guide plate defining a light incident surface, a light emitting surface and a bottom surface opposite to said light emitting surface;

positioning a non-polarized light source beside the light incident surface;

positioning a pair of prism plates with at least one of said pair being attached to the light emitting surface; and

positioning a quarter wave plate on the bottom surface with a reflective film opposite thereto; wherein

light enters said pair of prism plates at a Brewster's angle so as to achieve a combined refractive light being a nearly pure p-polarized one and a reflected light being an entirely s-polarized one, and wherein the reflected light further is converted to be p-polarized one by said quarter wave plate and further reenters the pair of prism plates to join said combined refractive light.